MULTI-FUNCTIONAL RUNNING MACHINE AND ITS CONTROLLING METHOD

TECHNICAL FIELD

The present invention relates to a multi-functional running machine and a method for controlling the machine and more particularly to a multi-functional running machine adapted to perform various exercises such as running, walking, wrenching, stretching, stooping and so on in accordance with the condition of a user's health or an exercise taste of the user by allowing a running belt to be reciprocally moved at a prescribed distance and permitting the user to input directly the reciprocating times, reciprocating distance and reciprocating speed of the running belt or use them selectively as programmed with various combinations. The present invention also relates to a method for controlling the running belt to be reciprocally moved a predetermined distance.

BACKGROUND ART

A running machine is an exercise tool adapted for the user to gradually walk or run on a running belt which is coupled rotationally and in an endless track to a pair

of rotation shafts, and the user can perform the exercise irrespective of the location of the machine.

However, in conventional running machines, a motor driving the running belt has only a function of uniformly rotating clock-wise or counter clock-wise and thus the running belt is moved only in a forward direction or a reverse direction. Accordingly, conventional running machines have only a function allowing an exercise involving forward walking or running or an exercise involving backward walking or running, and as a result the user is incapable of performing certain exercises.

DISCLOSURE OF THE INVENTION

Technical Problem

An object of the present invention is to provide a multi-functional running machine capable of performing conventional exercises such as walking or running by controlling the reciprocating times, reciprocating distance and reciprocating speed of the running belt to a predetermined distance so as to allow a reciprocating movement to be performed as well as capable of completely performing, by the

running machine, various exercises such as stretching of respective parts of a body, a muscular exercise and the like. Another object of the present invention is to provide a method for variously controlling the running belt to allow it to be reciprocally moved to a predetermined distance.

Technical Solution

A multi-functional running machine according to the present invention is characterized in that the machine is adapted to control the reciprocating times, reciprocating distance and reciprocating speed of a running belt and thus allows the user to selectively perform various exercises such as basic running and walking as well as wrenching, stretching, stooping and so on in accordance with the condition of the user's health or an exercise taste of the user.

In the construction of conventional running machines, a running belt 5 is wound to have an endless-track movement on two rotational shafts 6 installed to be spaced to a predetermined gap from each other, any one of the rotational shafts 6 is coupled via a belt 18 to a motor 13, and the running belt 5, the rotation shafts and the motor 13 and so on are installed inside of the lower frame 1 that serves as an external casing. Further, a support frame 2 is installed into one side of the lower frame 1. The

support frame 2 is attached with a handle 3, and on the upper portion of the running machine, installed is a scale plate 4 indicating a running speed, a running time, a calorie consumption amount and so on.

The multi-functional running machine 100 according to the present invention adapted for a running belt 5 to perform conventional functions as in the above conventional structure is characterized in that the running belt is reciprocally moved to a given distance by a separate program mode or the user's input mode.

As described above, a construction for controlling the reciprocating movement of the running belt 5 comprises a sensor 9 for variously sensing actuating information including a reciprocating time, a reciprocating distance, a reciprocating speed, forward and reverse rotations and the like so on, and a motor driver 24 for controlling the motor 13 to allow the running belt 5 to be reciprocally moved.

According to the above construction, in estimating the moving distance of the running belt 5 due to the rotation of the motor 13, information regarding the forward and reverse rotations sensed by the sensor 9 and the speed and moving distance of the running belt 5 is transferred to a control unit and then the control unit directs a command to the motor driver 24 for allowing the running belt 5 to perform an exact

reciprocating movement by analyzing the information in accordance with the actuating program of the running belt 5 inputted in advance. The command of the motor driver 24 allows the speed of the motor 13 to be increased or reduced, to be rotated in forward or reverse and to be stopped, and therefore it is possible to control the running belt 5 in the running machine.

As such, information about the running belt 5 can be obtained by measuring the rotation speed, rotation direction and rotation times of the rotation shaft on which the running belt 5 is wound. Namely, this is because it is possible to detect the most reliable rotation speed and the like of the running belt 5 in the adjacent belt pulley 8 in the running belt 5.

The above construction and method according to the present invention were adapted because when the rotation speed, rotation direction and rotation times are measured and calculated, the reciprocating times, reciprocating distance and the reciprocating speed of the running belt 5 cannot exactly be controlled due to a slip of a belt 18 and so on. However, in a structure designed to prevent the slip of the belt 18 and so on, it is possible to adapt a sensor recognition scheme in the belt pulley 8 in the motor 13.

Accordingly, a preferred embodiment of the above sensor 9 may consist of a reflective plate 10 attached to the rotation shaft 6 coupled to the motor 13 and a detector 11 for making a light shine on the reflective plate 10, detecting the reflected light and determining the actuating information. Alternatively, the sensor may be variously constructed using an optical sensor as well as a sensor employing a magnetic field which is not affected with dust. Also, the sensor may be implemented by having the belt pulley 8' attached with the reflective plate 10 or a magnet.

The reflective plate 10 is printed with an "A" image 25 and a "B" image 26 stepped apart from each other, and the detector 11 is a complex sensor for sensing two images and it determines forward and reverse rotations in accordance with the detected order of the A mirror 25 and B image 26.

While the control unit's command indicating the output of the motor 13 directs a forward rotation and thus the running belt 5 is forwardly rotated, if the control unit directs a reverse rotation command, a very small amount of reciprocating movement may occur in a moment in the motor 13 irrespective of the control unit's command due to an over-action of physical power of the exercising person and inertia. Therefore, in order to calculate a correct error of the reciprocating distance,

it is desirable to increase the number of marks on the reflective plate 10, that is, the A image 25 and B image 26, to thereby reduce the distance of the error.

Therefore, the motor 13 is controllably rotated in accordance with the exercise program selected by the user via a scale selecting switch and thus the movement of the running belt 5 being moving by the rotation of the rotating shaft coupled via the running belt 5 to the motor 13 can appropriately control the reciprocating distance, reciprocating speed and reciprocating times based on the exercise program which was selected by the user.

The present invention may be applied by various constructions and methods for safety in which a recognition table 23 is plurally-formed on the lower frame 1 and the running belt 5, respectively and in an equal interval so that the user can easily identify with the naked eye the reciprocating times, reciprocating distance and reciprocating speed. Accordingly, because the recognition table formed on the lower frame 1 is fixed and the recognition table 23 indicated on the running belt 5 is moving, the user can estimate the speed, direction and distance by recognizing the relative distance while exercising. As such, the lower flame 1 having the recognition table 23 indicated thereon and the running belt 5 are shown in FIG. 1.

As another safety device, a safety switch for stopping the running belt 5 is attached to the side surface of the lower frame 1 or the surface toward the running belt 5 of the support frame 2. Accordingly, it is possible to stop the running belt 5 at any time while exercising by operating the safety switch 17. The safety switch 17 can be freely positioned at any place other than the above mentioned position.

As another safety device, a lamp or speaker warns of any change between forward or reverse rotation, thereby allowing the user to recognize it visually or acoustically. As such, the change is alarmed visually or acoustically by a kind of alarming sound or alarming light informing the user that he/she is performing an exercise other than walking or running in the running machine 100 and thus the alarming function serves to improve safety by making the user aware so that the user can physically respond at the time when the change of direction of the running belt 5 was made.

In a reciprocating movement having such safety in exercise, installed is a subsidiary handle 22 as a means for causing more varied exercising modes. That is, the subsidiary handle 22 is detachably coupled to the support frame 2 or installed on the subsidiary frame 21 of the support frame 2 so as to be used during various exercises.

The user can perform a waist stooping exercise by pulling by hand or loosening the subsidiary handle 22 made of, for example, a rope. Therefore, thanks to the subsidiary handle 22, the user can perform a powerful stooping exercise and at the same time avoid an inappropriate exercise by pressing or loosening his waist with the pulling of the rope without a separate input of program on the scale plate 4 during a reciprocating exercise of the running belt 5. Accordingly, it can provide the user with a variability and convenience when the user is performing a waist stooping exercise.

As a constitutional element for the extension of such various exercise attitudes, a subsidiary base 7 is installed. That is, the subsidiary base 7 is installed on one end of the lower frame 1 or the adjacent side thereof so that the user can perform a stretching exercise or a muscular power exercise, touching it with his leg, knee or hand. The subsidiary base 7 may also be constructed to be fixedly coupled to one end of the lower frame 1. In a structure located at the bottom to be spaced at a predetermined distance without having the fixedly coupled structure, it is desirable to attach a pad to the lower bottom portion in order to prevent slipping.

Further, the running belt 5 may be attached with a detachable pad 16 to be supportably used when performing various exercises. The pad 16 is provided so that

the user can keep his hands sanitary on the running belt 5, and it serves to visually confirm the function of the recognition table 23 with respect to the reciprocating speed and distance.

The present invention having the above structure allows the user to selectively perform various exercises including conventional walking and running exercises as well as a stretching exercises for the legs, a muscular power exercise of abdominal muscles, a stretching exercise for the side, a stretching exercise for the body, a stretching of the arms and a muscular power exercise for the latissimus dorsi by controlling the reciprocating times, reciprocating distance and reciprocating speed of the running belt 5 to be reciprocally moved.

As such, the device for controlling the running belt 5 comprises a sensor 9 for sensing actuation information of the rotation shaft 6 and a motor driver 24 for controlling the rotation movement of the motor 13, which will be described in detail with reference to FIG. 2.

FIG. 2 shows as one preferred embodiment of the sensor 9 which comprises a reflective plate 10 and a detector 11. The reflective plate 10, which is a plate having two colors or different materials crossed alternately on its circumference at a given

angle, may be made of materials capable of reflecting a light or used as having a pattern printed thereon in order to determine forward and reverse rotations. Further, the reflective plate 10 is attached to the surface of the belt pulley 8 coupled to the rotation shaft 6 of the running belt 5 and is coupled via belt 18 to a belt pulley 8' of the motor 13, and thus reflects a light equally rotating therewith. Alternatively, the reflective plate 10 may be attached to the belt pulley 8' of the motor 13.

The detector 11 shines a light into the reflective plate 10 and detects the reflective light to thereby determines the actuation information including the forward and reverse rotations and speed of the running belt 5. The detector 11 is installed at an appropriate position parallel with the reflective plate 10 with being spaced with the reflective plate 10 at a given distance. Herein, the detector 11 is preferably tightly fixed to the lower frame 1.

Accordingly, the sensor 9 detects actuation information of the rotation shaft 6 coupled via the belt 18 to the motor 13, wherein since the rotation shaft 6 is wound and rotationally moved with the running belt 5 on an endless track, it is possible to detect the reciprocating times, reciprocating distance and reciprocating speed of the running belt 5 from the actuation information of the rotation shaft 6.

As such, the movement information of the running belt 5 detected by the sensor 9 is inputted to a control device for controlling the rotation of the motor 13 and the control device controls the motor 13 by comparing the rotation direction, rotation speed and rotation times of the motor 13 which are determined in advance in accordance with running or stretching exercise program selected by the user with the actuation information of the motor 13 being inputted from the sensor 9 to thereby allow the exercise program to be correctly performed.

The motor driver 24 additionally attached to the present invention functions to perform the conversion of the forward or reverse of motor 13 and stop the motor 13 for several seconds. Herein, the several seconds may be three to four seconds and are set as the time for increasing a stress on a leg or waist stretched for a long time by the user's stretching exercise.

Accordingly, the motor 13 is rotated under the control of the rotation direction, rotation speed and rotation times thereof by the control device and the motor driver 24 in accordance with the exercise program selected by the user via a selecting switch of the scale plate 4 in the running machine 100 and thus the movement of the running belt 5 being moved with the rotation of the rotation shaft

6 coupled via the belt 18 to the motor 13 can be controlled appropriately in accordance with the exercise program selected by the user.

That is, when performing general walking and running exercises, the motor 13 is rotated in a predetermined direction and speed, while when performing stretching or muscular power exercises including leg exercises, abdominal muscles exercises, waist exercises and body exercises, the motor 13 is rotated while changing the rotation direction by a predetermined time interval to allow the running belt 5 to be reciprocally moved.

As such, the invention which is directed to a method for controlling the running belt 5 of the running machine 100 is characterized by calculating the reciprocating times, reciprocating distance and reciprocating speed of the running belt 5 using the rotation times and rotation speed of the rotation shaft having the running belt 5 wound thereon. Accordingly, it is possible to control the reciprocating movement of the running belt 5 more accurately. Of course, it may be possible to control it by detecting the reciprocating times, reciprocating distance and reciprocating speed and comparing them with that set in advance. Further, as a control method for safety, when the running belt 5 is forwardly or reversely rotated, it may be configured for the running belt 5 to be stopped if it is moved above the set

time in any one direction. That is, when a time that calculated the distance and speed in any one direction is over, the running belt 5 is stopped by estimating the error time on the program. This error time is applied as a time that reaches from the scale plate 4 to any side portion of the reciprocating running belt due to the sensor's malfunction or other unclear error and thus the running belt 5 is prevented from consistently moving in only one direction to thereby protect the user from a dangerous situation.

Herein, the error time is set by adding a given redundant time to the settled reachable time of the running belt 5. The redundant time is an appropriate time to prevent the running belt 5 from more sensitively responding: if the error time is set more shortly, frequent emergency stops are generated. That is, in case that the movement distance in a direction during reciprocating movement of the running belt 5 is 30 cm and 50 cm, respectively, and the respective reaching time in one direction is determined in accordance with the speed and the reaching time is summed with the redundant time to thereby set the error time. The redundant time in the case of 50 cm is set long compared with the time in the case of 30 cm.

Also, the actuation pattern of the running belt 5, that is, various reciprocating distances, reciprocating times and reciprocating speeds can be used by the user with his direct input or used selectively by the user in accordance with the program set in

advance in various combinations. An input device for the user can be used by installing it on the scale plate 4 and by conventional manipulation on the scale plate 4, if selectable.

The running machine 100 according to the present invention allows the running belt 5 to perform various exercises including a stretching exercise and muscular power exercise with the reciprocating movement by the method and structure described above. Herein, in order to effectively perform a stretching or muscular power exercise when performing it, a subsidiary base 7 may be coupled to the end or positioned adjacent to the side of the lower frame 1 in which the support frame 2 in the running machine 100 is not installed, and a subsidiary handle 22 may be detachably installed on an appropriate portion such as the support frame 2 or the subsidiary frame 21 installed on the support frame 2.

As shown in FIG. 1, a coupling hole 20 is formed on both sides of the end of the lower frame 1, a coupling pin 15 is formed on the end of the rope or chain coupled to the both sides of the subsidiary base 7 and the coupling pin 15 is fixedly inserted into the coupling hole. As a result, the subsidiary base 7 can be used integrally with the lower frame 1 to thereby provide stability.

Various structures other than the coupling structure described above may be implemented. A pad for preventing only a slipping without having the structure of a coupling hole 20 and a coupling pin 15 may be attached to the lower surface of the subsidiary base 7. The scheme for fixing the subsidiary base 7 is not limited only to the above example and can employ any schemes allowing the subsidiary base 7 to maintain a predetermined distance with the lower frame 1 during the exercise.

Because the subsidiary base 7 installed adjacent to the rotatably moving running belt 5 is fixed at its place, a leg stretching exercise can be performed by putting a respective leg on the subsidiary base 7 and the running belt 5 and then reciprocally moving the running belt 5 along a predetermined distance. A muscular power exercise of shoulder and abdominal muscles can be performed by putting knees on the subsidiary base 7, putting arms on the running belt 5 and reciprocally moving the running belt 5 along a predetermined distance. Herein, a soft composite resin or textile may be attached to the upper surface of the subsidiary base 7.

And, the subsidiary handle 22 is detachably attached to the support frame 2: the subsidiary handle 22 may be attached directly to the support frame 2 or coupled to the center of the subsidiary handle coupled detachably to the support frame as shown in FIG. 1. The subsidiary frame 21 may be used as a handle. User in the

running machine 100 can grip the subsidiary handle 22 and thus stably maintain his upper body when stretching both knees and waist as shown in FIG. 6.

The subsidiary handle 22 is preferably a long rope shape as shown in FIG. 1 and its end is preferably branched into two pieces so that both hands can grip the pieces, respectively.

As such, by making the subsidiary handle 22 a rope shape, it is possible to appropriately change the grip position in accordance with exercises and thus it can be used stably and conveniently.

Further, according to the present invention, the effect of exercise can be maximized by allowing the actuation pattern of the running belt 5 to have the following steps: the step of moving the running belt 5 a predetermined distance; the step of having a stopping period to stop the running belt 5; and the step of releasing the running belt 5 by moving it to a predetermined distance in the same direction. Thus, in case that a leg or arm is put on the running belt 5 and the subsidiary base 7, respectively, the widened state is maintained to a predetermined time and then allowed it to be further widened to a predetermined distance to thereby have the release effect.

Also, by making the speed of any one side slow or fast with maintaining the distance during forward and reverse rotations, it can hold various stress-mitigating capabilities capable of promptly mitigating the limiting point that the body of the user is able to bear.

As an example of exercise, when being slowly pressed to an unbearable distance with an exercise attitude of a commercial product called an "AB slider", if the running belt 5 slowly comes at the speed that the running belt 5 goes, the user may fall without keeping his weight and thus in order to prevent it, the coming speed of running belt 5 is applied fast. This movement is also applied to a leg stretching or other exercise.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a multi-functional running machine according to the present invention;

FIG. 2 is a detailed view of a driving section of the running machine;

FIG. 3 is a view illustrating a stretching exercise of leg using the running machine;

FIG. 4 is a view illustrating a muscular power exercise of shoulder and abdominal muscles using the running machine;

FIG. 5 is a view illustrating a stretching exercise of the side using the running machine;

FIG. 6 is a view illustrating a stretching exercise of both knees and waist using the running machine;

FIG. 7 is a view illustrating a muscular power exercise of the chest using the running machine;

FIG. 8 is a view illustrating a stretching exercise of the side and a muscular power exercise of abdominal muscles using the running machine;

FIG. 9 is a view illustrating a stretching exercise of the waist and legs using the running machine;

FIG. 10 is a view illustrating various actuating patterns of the running belt; and

FIG. 11 is a view illustrating various embodiments of the subsidiary handle.

BEST MODE FOR CARRYING OUT THE INVENTION

Now, exercises using the running machine 100 of the present invention will be described in detail.

Firstly, FIG. 3 shows a leg stretching exercise. One leg is put on a fixed subsidiary base 7 and another leg is put on the running belt 5 being moved. Then the running belt 5 is reciprocally moved in both directions at a speed and distance without causing excessive stress on the legs and thus the leg stretching exercise can be performed with the gap between both legs being widened and narrowed.

Of course, if the running belt 5 is maintained during a predetermined time after the move to a predetermined distance, the leg is maintained at the widened state resulting in the maximized effect of its stretching and thereafter if the belt is moved

in the same direction, the leg is further widened, resulting in the achievement of a release effect.

And, in this case as well as all other exercises, if the running belt 5 is continuously moved in one direction, the motion of the running belt 5 can be stopped by automatically breaking a power supply.

FIG. 4 shows a muscular power exercise or shoulder and abdominal muscles. Two legs and a knee are put on the subsidiary base 7 fixed without the movement and two hands are evenly put on the running belt 5 being moved. Then, the running belt 5 is reciprocally moved in both directions at a speed and distance without causing excessive stress to the leg, and the push and release of the abdominal muscles are repeated. Therefore, the muscular power exercise of the abdominal muscles against gravity can be performed.

Herein, when a user wishes to put two hands on the running belt 5, a pad 16 is first put on the running belt 5 to thereby sanitarily protect the user's hands.

FIG. 5 shows a stretching exercise of the side. A handle 3 attached to the support frame 2 is gripped so as to maintain the body and the user stands upright with

two feet evenly placed on the running belt 5. Then, the running belt 5 is reciprocally moved in both directions at a speed and distance without causing excessive stress to the body and the push and release of the side muscles are repeated with the left and right movement of two legs in the same direction. Therefore, a stretching exercise of the side can be performed.

FIG. 6 shows a stretching exercise of both knees and waist. The user sits on the running belt 5 of the lower frame 1 with two legs being stretched and then grips the subsidiary handle 22 coupled to the subsidiary frame 21 of the support frame 2.

After the user establishes the above position, the running belt 5 is reciprocally moved in both directions at a speed and distance without causing excessive stress to the body and thus the user's upper body fixed by the subsidiary handle 22 is bent and then stretched. Therefore, a stretching exercise of the waist can be performed.

Herein, the subsidiary handle 22 being used is made of a rope or a resilient band having a high resilient coefficient to thereby make the displacing force weak. This is to avoid the problem that if the displacement of the subsidiary handle 22 becomes large during exercise, the user's stability in position is not well maintained and if the subsidiary handle 22 has no resilient nature, an excessive stress is applied

to the user's body when the running belt 5 is rotated to only one side due to an abrupt malfunction.

FIG. 7 shows a muscular power exercise of the chest. That is, the user puts two hands on the subsidiary base 7 and the pad 16 of the running belt 5, respectively and the running belt 5 is reciprocally moved. Then, the stretching or concentrating of two arms is repeated. Therefore, the muscular power exercise of the chest can be performed. FIG. 8 shows a stretching exercise of the side and a muscular power exercise of abdominal muscles. The subsidiary base 7 is positioned on the side of the lower frame 1. That is, the user puts two knees on the subsidiary base 7 and puts two arms on the running belt 5 to be widened to a predetermined distance. Then, the side is stretched in accordance with the reciprocating movement of the running belt 5 and at the same time, the muscular exercise is performed

FIG. 9 shows a stretching exercise of the waist and legs. The user performs the exercise with his back against the running belt 5. That is, the user lies with his head placed toward the scale plate 4 and legs are placed on the subsidiary handle 22'. And then, the waist and legs are repeatedly stressed to perform a stretching exercise and then released in accordance with the moving direction of the running belt 5.

When performing the exercise as shown in FIG. 9, the embodiment of the subsidiary handle 22 shown in FIG. 11 can be usefully compared with the embodiment of the subsidiary handle 22 shown in FIG. 1.

That is, the subsidiary handle can be implemented in various ways: the subsidiary handle 22 shown in FIGS. 1 and 11 is branched at its one end into two pieces and is fixed at its other end to the subsidiary frame 21. In order to be coupled easily and detachably to the subsidiary frame 21, the subsidiary frame 21 may be installed with a coupling hole formed with a coupling aperture and the other end of the subsidiary frame 22 may be formed with a coupling ring 28.

And, another embodiment of the subsidiary handle is the same as shown in FIGS. 9 and 11, wherein a coupling ring 28 of a long rope shape is attached to both ends of the subsidiary handle. Two coupling holes are required in order to install it on the subsidiary frame 21.

Such various subsidiary handles 22 and 22' can be selectively installed in accordance with the type of movement associated therewith and thus it is possible to perform very convenient, safe and effective movements.

When the movement of running belt 5 needs to be stopped due to a decrease in the user's strength or an abrupt situation in the course of performing the above respective exercise, stopping the running belt 5 by actuating a switch installed on the scale plate 4 is inconvenient and is dangerous during exercise and thus a safe switch 17 is installed on the one side of the lower frame 1 in order to stop the running belt 5 simply and safely. Accordingly, the user can stop the running belt 15 by actuating the safe switch 17 with a simple bend of his body during a stretching exercise.

The present invention can provide various operating patterns of the running belt 5. Although one embodiment among them was mentioned above, other embodiments of various operating patterns of the running belt 5 are shown in diagrams (a) to (f) in FIG. 10. In FIG. 10, the starting and arriving points, that is, the points of both ends of the reciprocating movement are indicated as A and Z, and specific points in the reciprocating movement area are indicated as A', B', etc. by adding thereto.

A variety of operating patterns shown in FIG. 10 can be applied to all exercises shown in FIGS. 3 through 8.

FIG. 10(a) shows the most basic operating pattern which is a movement between a starting point A and an arriving point Z reciprocally with a constant speed.

FIG. 10(b) shows that the running belt 5 is reciprocally moved between the point A and the point Z, in which the speed of the running belt 5 when it moves from A to Z is more slowly actuated than when it moves in the opposite direction thereto. Otherwise, the running belt 5 can be actuated in a reversed method from the above-mentioned method.

FIG. 10(c) shows that while the running belt 5 is reciprocally moving a short distance, it reciprocally moves to A and Z which is all reciprocating distance and then it reciprocally moves at a short distance again and returns to the point A.

That is, the running belt 5 reciprocally first moves a short distance from the starting point A to A', then moves to the point Z after reciprocally moving from B' to A, then reciprocally moves a short distance from Z to C', then reciprocally moves a short distance to D' after moving to A, and then moves to Z.

The above A-A', A-B', A-D' and C'-Z movements may be equal to or different from each other in distance. The distance can be selected depending upon various patterns of exercises.

FIG. 10(d) shows a pattern whereby the running belt 5 is stopped during a predetermined time at one or more middle points between A and Z. That is, the running belt 5 has a stopping period for several seconds after moving from A to A' and has a stopping period again after moving to B' and then moves to Z. When returning, it moves to just A. The pattern is also only one embodiment; there may be one or two more stopping points in the route from A to Z and there may be a stopping point in the route returning from Z to A.

FIG. 10(e) is one example whereby the running belt 5 is reciprocally moved at a short distance in the route from A to Z. That is, FIG. 10(e) shows a pattern whereby the running belt 5 is moved forward to A' and then moved backward to B', and again the running belt 5 is moved forward to C' and then moved backward to D', and thereafter the running belt 5 is moved forward to E' and then moved backward moved to F'. And then, the running belt 5 is moved forward to Z and then moved backward to A.

Of course, in this case, the number of the short reciprocating periods may be freely set and length of each may also be set appropriately.

FIG. 10(f) shows a pattern whereby the overall reciprocating movement and a short reciprocating movement are made alternately. That is, after the reciprocating movement of the short period of A to A', the reciprocating movement of A to Z is made and again after the reciprocating movement of A to B', the reciprocating movement of A to Z is made. Of course, in this case, the length of the A-A' and A-B' distances may be equal to or different from each other.

Various exercises as described above can be implemented by the present invention and the user performing his exercise on the running belt 5 being reciprocally moved can control the pressing or releasing of his body by moving little by little on the running belt 5 without separately operating the scale plate 4 during exercise and so on. Therefore, aspects capable of using the running belt are various and thus the variability and convenience of exercise can be provided for the user.

INDUSTRIAL APPLICABILITY

As such, the present invention can control the reciprocating times, reciprocating distance and reciprocating speed of the running belt 5 in accordance with actuation information of motor 13 detected by the sensor 9 and exercise information selected by the user to thereby allow bi-directional movement to be possible. Accordingly, the user can perform various exercises including various stretching exercises in addition to walking and running exercises using the running machine of the present invention.